failed to show any change in the rate of growth. The material was nontoxic; 1.0 to 5.0 cubic centimeters were given intramuscularly or subcutaneously every day, with neither local nor general reactions. Diabetes and reduction in the blood nonprotein nitrogen did not occur, as in Cushing and Teel's experimental animals. There were no untoward effects on other systems. The growth results of Engelbach and Tell, and Shelton and Evans, who used different types of material, could not be corroborated. However, it is possible that better results might have been obtained had a larger injection (5 to 10 cubic centimeters) been given daily.

INTRA- AND POSTPARTUM HEMORRHAGE*

By CLARENCE A. DEPUY, M.D.
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DISCUSSION *by Ludwig A. Emge, M.D., San Francisco; Clarence W. Page, M.D., Berkeley; T. F. Wier, M.D., San Diego.*

OF the tragedies that occur in medicine perhaps none are more terrifying than death caused by hemorrhage. Especially is this so when the individual happens to be a woman in the prime of life, who is rendering the supreme sacrifice bestowed to her sex in bringing into the world a new being. This sudden loss of life to the young mother is usually not expected, and what was anticipated to be a happy event turns out to be a great sorrow. The new-born infant will forever be deprived of a mother's love and guidance, and will be left to the tender mercies of relations and friends.

To the unfortunate physician who officiates at such an event our sympathy is extended; for, as you all know, these tragedies do not rest lightly upon his shoulders: a few more sleepless nights, a few more gray hairs, are his reward.

RECENT STUDIES OF MATERNAL DEATHS

During the past few years much attention has been given by various medical organizations and the government to the study of maternal deaths; cities, states, and societies have made detailed investigations to try to determine the cause and to fix the responsibility. Standard forms and charts have been prepared so that one community may be compared with another, and the surprising feature of these reports is the similarity of percentages obtained all over the United States.

In dealing in the causes of death in the last trimester of pregnancy (this, of course, eliminates the abortion cases), hemorrhage ranked second on the Pacific Coast.

In the Coast report of maternal mortality study in seven cities, made by the Pacific Coast Society of Obstetrics and Gynecology, hemorrhage accounted for 15 per cent of the deaths. In the San Francisco Bay Counties report made by the San Francisco Bay Counties Obstetrical Society, hemorrhage accounted for 13 per cent. In the maternal mortality report in fifteen states, made by the United States Department of Labor, hemorrhage accounted for 11 per cent of deaths. By far the greatest number of the deaths caused by hemorrhage was listed as postpartum hemorrhage. To illustrate: In the maternal mortality report of seven Pacific Coast cities for the years 1933 and 1934, there were eighty-eight deaths from hemorrhage, and in seventy instances it was the primary cause of death. In eighteen it was the contributory cause. Placenta previa occurred seven times. Premature separation of the placenta occurred eleven times. Fifty-two postpartum hemorrhages occurred, and in forty-five cases it was the direct cause of death. Fifty per cent were in their first or second pregnancies, and fifty per cent had normal pregnancies. In twenty-four cases the hemorrhage followed spontaneous delivery. Of the remainder, nine had cesarean sections, two had forceps deliveries after manual dilation of the cervix, three forceps deliveries only. Fourteen had labor induced artificially. Of the total, fourteen were associated with delivery of the placenta, thirteen had uterine packing, and only eleven cases had transfusions.

Twenty-four of the fifty-two postpartum hemorrhages were considered preventable by the attending physicians; eighteen were listed as due to errors in judgment; two attendants were judged incompetent; three were charged with failure to repair deep lacerations of the cervix, and one to an unrecognized rupture of the uterus.

Twenty-eight deaths in this section were deemed not preventable. Fifty-four per cent followed operative deliveries.

Thirty-six autopsies were performed in these patients: One showed an unrecognized rupture of the uterus; two showed retained portions of placenta; the others showed merely the resultant anemia.

FREQUENCY

The textbooks on obstetrics have not been able to give any accurate estimate as to the frequency of these complications, and it is only by the careful study of all maternal deaths that we can determine the frequency.

Shears says the frequency with which a man meets this complication is a fairly good index of his ability as an accoucheur, but adds, however, that there are exceptions to this rule.

CLASSIFICATION

Hemorrhages occurring during labor are divided into three forms. Antipartum, intrapartum, and postpartum. It is to the latter two forms of hemorrhage that this discussion applied. Hemorrhages may also be classified according to causes into two varieties: traumatic and atonic. Traumatic hemorrhage is the term applied to the hemorrhage due to laceration of any part of the genital tract. It may be further subdivided into external traumatic and internal traumatic. Atonic hemorrhage is the term applied to hemorrhage due to failure of the uterine muscle to contract.

A moderate blood loss, estimated to be from 100 to 300 cubic centimeters, is a necessary part of every labor. When the blood loss becomes excessive, then the term "intrapartum or postpartum" hemorrhage is applied.

*Read before the Obstetrics and Gynecology Section of the California Medical Association at the sixty-sixth annual session, Del Monte, May 2-6, 1937.

TRAUMATIC HEMORRHAGE

Let us first consider traumatic hemorrhage. Broadly speaking, bleeding with a hard uterus usually comes from laceration. After forceps or other operations, lacerations are to be looked for and they will be found in the operative field. Lacerations of the genital tract are more frequently the cause of hemorrhage than is generally supposed. These lacerations may occur at the pelvic outlet in the lateral vaginal walls, vaginal fornix, the cervix or the lower uterine segment.

The principal difficulty in the treatment of these injuries seems to be in the diagnosis, and this should easily be made on careful inspection instituted early and before the patient has lost 1,000 cubic centimeters of blood or more.

Tears of the outlet are easily seen. Tears of the vaginal fornix and cervix can be seen with the aid of vaginal retractor or speculum. The patient should be placed in the lithotomy position, properly draped to avoid infection, and then the speculi inserted, the vagina wiped free of all blood-clots, the cervix grasped with a sponge forceps and brought to the vaginal orifice where a careful inspection can be made and the vaginal vaults explored. When lacerations are found they can usually be sutured without difficulty and the bleeding controlled. I want to emphasize again the importance of diagnosis.

ATONIC HEMORRHAGE

With chloroform anesthesia, and before the days of pituitrin and better standardized preparations of ergot, this was a real factor to be dealt with, and even today this form of hemorrhage is still responsible for quite a number of deaths.

There are three factors which normally control bleeding in the uterus:

1. The contractions of the uterine muscular fibers.
2. The retraction of the uterine muscle fiber.
3. The clotting which occurs in the vessels.

The contraction of the muscular coat of the uterus brings about a temporary cessation of hemorrhage during their occurrence. Each fiber diminishes in length and as a result the whole organ becomes a firm, hard mass, and its supplying arteries are compressed as soon as the contraction passes off, and it only lasts a very short time; the uterine fibers lengthen; the compression of the vessels ceases and hemorrhage would begin again if another factor quite distinct from the contraction, but in a manner dependent upon it, did not also occur. This factor, which is the most potent agent, is causing the permanent cessation of hemorrhage, is the retraction of the uterine muscle fibers.

Retraction brings about a reduction in the size of the uterus sufficient to cause a permanent kinking and compression of the placenta vessels. It is, therefore, the process to which the final and permanent checking of hemorrhage is due.

The clotting which occurs in the vessels is so unimportant a factor in checking hemorrhage that it may almost be neglected. It may be the direct cause of the cessation of hemorrhage in some small vessels, but it is probably more correct to consider it a result rather than a cause of the cessation of hemorrhage.

These are the normal agencies by which hemorrhage is prevented, and in knowing them, we can better understand the conditions which favor hemorrhage, conditions which prevent the due retraction of the uterine muscle fibers either directly as a retained placenta, or indirectly by preventing contraction from taking place, like degeneration of the fibers from pathological conditions as in the toxemias of pregnancy. Abnormal adherence of the placenta to the uterine wall, with partial separation, causes the worst form of uterine hemorrhage.

TREATMENT

Treatment is both prophylactic and curative. Ideal obstetrics demands that no woman should lose enough blood to give rise to symptoms of anemia. Under the heading of prophylactic treatment, I would like to suggest to all health authorities who are granted the privilege of issuing permits for operating maternity departments that they make a careful inspection of delivery rooms, labor rooms, nurseries, and the department in general, to see that they are properly equipped for handling obstetrical emergencies, and especially accidents that happen during labor. The help needed must be rendered at once and does not permit of delay, and especially is this so in the hemorrhage cases.

Every delivery room should have proper instruments, such as vaginal retractors and speculi, and emergency kits, sterilized and ready for use. The head of the obstetrical department or other responsible persons should make routine inspection to see these needs are provided for.

PROPHYLACTIC TREATMENT

Prophylactic treatment consists in the proper management of pregnancy to eliminate and avoid the toxemias which predispose to bleeding, the proper management of labor to avoid exhaustion, and proper management in particular of the third stage of labor.

A point I would like to emphasize is the avoidance of premature attempts to express the placenta from the uterus before separation has taken place. The retroplacenta clot is expressed and this retards proper separation, and makes the third stage more prolonged and difficult. The use of a marker on the cord, applied when the cord is severed, may give some information when the placenta has passed into the lower uterine segment or vagina.

The use of pituitrin immediately following the second stage of labor has cut the usual blood loss in half and greatly reduced the time of the third stage.

CURATIVE TREATMENT

The curative treatment is most satisfactory if it is intelligently carried out. It is essential to have a definite plan.

1. If hemorrhage starts after the birth of the child, and it is not checked by massage of the fundus, ascertain whether the placenta is in the uterus or vagina.

2. If the placenta is still in the fundus, express it by the Crede method, and if in the vagina remove it manually, then give ergotocin.

The discovery of a new preparation of ergot has eliminated most of the uncertainty which has characterized the use of ergot. A new principle has been isolated in chemically pure form, and this substance has been shown to possess all the desirable oxytocic activity of ergot itself. This new preparation has been named ergotocin, and has been placed on the market in tablet and ampoule form under the trade name of ergotrate. Given orally or intramuscularly, it acts in eight to twelve minutes; the intravenous injections within fifteen seconds. This causes a tetany of the uterine muscular fiber, followed by slight intermittent contraction, the end-result is a firm persistent contraction of the uterus lasting for a number of hours and a contraction of the type necessary to control uterine hemorrhage. Its use has not been recommended during the third stage of labor as a routine procedure, but where an oxytocic drug is indicated it might be used as safely and more effectively than any other known oxytocic. The dose in ampoule form for intravenous use is 1/320 grain, repeated when necessary.

3. If this fails to check the bleeding, give a hot intra-uterine douche of one-half per cent acetic acid solution at a temperature of 115 degrees Fahrenheit.

4. If bleeding still continues, compress the fundus firmly between one hand in the uterus and the other hand on the abdominal wall, and if hemorrhage resists the above treatment.

5. The uterovaginal canal must be firmly packed with gauze. If properly done, this is a method as certain as anything can be in its immediate action.

If in spite of all the above treatment hemorrhage still persists, the only thing to do is to apply a Momburg belt or tourniquet.

6. Treat the anemia. Keep the patient quiet with morphin, apply external heat. Give intravenous solutions, and arrange for a transfusion as soon as possible. I wish to call your attention again to the Pacific Coast Society report of eighty-eight women that died of hemorrhage, only eleven of whom had transfusions.

A point I would also like to emphasize in the treatment of these hemorrhage cases is the extra care that should be used in avoiding infection. These cases are very prone to develop puerperal sepsis due to the lack of resistance from the loss of large amounts of blood.

SUMMARY

To summarize, I would like to remind you of the frequency of these hemorrhage cases. Hundreds of women bleed to death of postpartum hemorrhage every year. Large percentages of these cases are deemed preventable by the physician. Only a few have transfusions. I would like to stress the importance of careful examination for tears and lacerations as a cause of bleeding, advise the use of a new preparation of ergot to stimulate better contraction of the uterus, and stress the importance of good technique to avoid sepsis.

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DISCUSSION

LUDWIG A. EMGE, M.D. (Stanford University School of Medicine, San Francisco).—Hemorrhage in pregnancy is always a formidable problem, regardless of the period at which it occurs. It is particularly dangerous when it takes place during the third stage of labor or during the first twenty-four hours after delivery. Doctor DePuy has so ably discussed the salient points of the subject that nothing of importance can be added. However, certain points cannot be stressed too often, and one of these is preparedness for emergencies. Whenever there is an intrapartum hemorrhage, no matter how slight, extensive preparations for an emergency are in order. These should include the typing of blood, the provision of a donor for transfusion, preparation for immediate surgical intervention, and the setting up of various facilities for the resuscitation and incubation of premature and debilitated infants. As soon as a state of emergency has been realized, every diagnostic aid should be utilized to determine the exact nature of the hemorrhage. Should the diagnosis point either to a premature separation of the placenta or an obstructive placenta previa, prompt intervention is in order, for the lives of both mother and child are at stake. This is one time when "intelligent interference" must take precedence over "masterful inactivity." Speedy decision and quick methods of attack are necessary for the successful treatment of any hemorrhage, particularly the late intrapartum and early postpartum hemorrhages. We all realize that the sound of a sudden rush of blood is terrifying, but this is no time for fear. Courage, quick thinking, and resourcefulness alone will stop the rapidly ebbing stream of life. The situation demands a thorough training and ample experience, and those who do not possess these prerequisites have no right to watch over the destinies of parturient women. I continue to be amazed at the lack of obstetrical conscience so often observed among practitioners, and the indifference on the part of the laity toward obstetrical qualifications. Every physician should read the reports of maternal mortality published by the San Francisco Bay Counties Obstetrical Society and the Pacific Coast Society of Obstetrics and Gynecology. They point very clearly that many obstetrical deaths are preventable. I have always been, and still am, of the opinion that a medical diploma and a state license do not give the moral right to take on the responsibility of an obstetrician any more than to practice major surgery, and the sooner this is realized by the profession the sooner will we take an important step toward the reduction of our maternal mortality. Doctor DePuy has condensed a great deal of thought, analysis, and advice for the management of a difficult condition into a few paragraphs. This very timely résumé permits reading between the lines, and should serve as a valuable sign for a dangerous crossing of medical roads.

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CLARENCE W. PAGE, M.D. (2560 Bancroft Way, Berkeley).—Hemorrhage is second only to puerperal sepsis in the causes of maternal mortality, and too much emphasis can never be placed upon its prevention and treatment, which Dr. DePuy has so well summarized. There are a few points which may well be stressed.

Among the contributing factors in the causation of uterine atony during the third stage are prolonged labors, especially those occurring with the dystocia dystrophy syndrome, severe toxemias of pregnancy, overstretched uteri resulting from multiple pregnancies or hydramnios, or congenital malformations of the uterus, which may result in an interference with the normal contractility of the uterus. When any of these factors are suspected prior to delivery, a compatible donor should be on hand ready for transfusion if needed. The slightest delay in the administration of blood following hemorrhage may be of serious import. Solutions of glucose or gum-glucose may be given intravenously while awaiting the blood, although recent reports of unfavorable sequelae from the acacia have made us a little more cautious in its use.

It is important to measure accurately the amount of blood loss, and equally as important to correlate this amount with the original blood volume (*i. e.*, size of the patient), and the presence or absence of anemia existent before delivery. For the immediate treatment of hemorrhage which can-

not be controlled with intravenous ergonovine and fundal pressure (and this is uncommon), I have discontinued intra-uterine douches and rely on immediate tamponade with gauze, wrung as dry as possible from a 5 per cent solution of acetic acid. The immediate repair of cervical lacerations when bleeding is excessive is imperative. We advocate routine inspection of the cervix after delivery, and repair when indicated. There are now on the market several satisfactory specula, making this examination fairly simple.

It is important that equipment for examination and repair of the cervix and for tamponade be ready at hand, as delay is dangerous. We have often noted that severe hemorrhage causes the physician to become excited and interferes with his judgment as to procedures to be followed. For the guidance of both the physician and nurses, we have posted in the obstetrical quarters the procedures to be followed and the equipment that should be ready at hand under these circumstances.

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T. F. WIER, M.D. (911 Medico-Dental Building, San Diego).—Doctor DePuy has given us a good review of the causes of maternal hemorrhage and its treatments. May I add that, as long as the medical profession in general regard a pregnant woman as in a physiological condition, and leaves to that "physiology" or "nature" to complete its act, so long then we may expect a high maternal mortality rate in this country. I would like to see an effort by the medical profession directed to the education of the young physician in a more thorough understanding of the necessity of guarding well a gravid woman.

SIMPLE EYE TESTS IN A PEDIATRICIAN'S OFFICE: THEIR VALUE*

By HELEN M. JOHNSON, M.D.
AND
WILLIAM PALMER LUCAS, M.D.
San Francisco

DISCUSSION *by George H. Kress, M.D., Los Angeles; George N. Hosford, M.D., San Francisco; Clifford Sweet, M.D., Oakland; A. Ray Irvine, M.D., Los Angeles.*

PHYSIOLOGISTS tell us that only four per cent of the population is emmetropic in both eyes. The proportion of those who are defective enough to require correction is estimated differently by various authorities who have studied the question, but there is universal agreement that the type of sensory impression received through the eyes has a profound effect on the mental as well as the physical outlook on life: the development of the personality as well as of the very character is affected by the eyesight. Innumerable so-called nervous symptoms, psychologic "twists," and undesirable personality traits are due to various eye conditions, and can only be alleviated by proper attention to the eyes. Many schools are now giving eye tests at the beginning of the school term, but the preschool child, by reason of his age, is neglected. How important it is, then, in this era of preventive medicine, for the physician—and the pediatrician in particular—to include in the physical examination of the child simple eye tests, both subjective and objective, in order to rule out visual defects which may be the causative factors in the development of an undesirable personality.

* Read before the Pediatric Section of the California Medical Association at the sixty-fifth annual session, Coronado, May 25-28, 1936.

COMMON CAUSES OF DEFECTIVE VISION

The child's ability to read a chart with ease may not mean that glasses are unnecessary. Many hyperopes are passed by, year after year, because they possess the ability to read the whole chart. The common causes of defective vision and a brief description of the symptoms and of the objective and subjective examination of the eyes as found practicable in a pediatrician's office will be reviewed.

The important defects may be classified as follows:

1. Anatomical variations in the shape and of the anteroposterior diameter of the eyeball cause (*a*) hyperopia; (*b*) myopia; (*c*) astigmatism.
2. Such muscle imbalances (heterophorias) as (*a*) esophoria; (*b*) exophoria; (*c*) hyperphoria.
3. Visible muscular deviations (heteropias) as (*a*) squint (internal strabismus) esotropia; (*b*) wall eyes (external strabismus) exotropia; (*c*) vertical deviation, hypertropia; (*d*) ocular torticolis.
4. Aniseikonia, a recently discovered condition in which there is a difference in the size and shape of the retinal images.

THE FAR-SIGHTED CHILD

At school the far-sighted child (simple hyperopic) reads the whole test chart with ease and is, therefore, frequently not included in the group which will be sent to the oculist for further examination. But this child often finds close work fatiguing because of the necessity for constant excessive contraction of the ciliary muscles; therefore he avoids reading and close work, and may be considered lazy, inattentive, and even stupid, in school. He reads for a short time and then becomes discouraged. He tends to become an extrovert, and to compensate for poor school work by an excessive interest in outdoor sports. Given an opportunity, he hunts well and can become an excellent shot. He usually does not complain of headache, although he has eyestrain which causes frowning and the development of wrinkles across his forehead. His hyperopia may tend to diminish as growth proceeds, or may remain substantially the same.

THE NEAR-SIGHTED CHILD

The myope, on the other hand, will read the letters on the Snellen chart fairly accurately to a certain point, and then will be unable to read further. He probably cannot distinguish the letters in a sign across the street. A tree appears to be a greet blot on the landscape, and he cannot distinguish the individual leaves. He tends to dislike most sports because he has found that he cannot cope on the playground with classmates who have better visual acuity. He cannot see the ball until it is a few feet from him, and he is, therefore, not chosen on the team. If left with uncorrected vision he tends to become an introvert; he feels that sports are a waste of time, and he does not develop the qualities of sportsmanship, the give and take, the ability to get along with his fellow men, which are needed for leadership in later life.